

WAVELENGTH SEPARATION DEVICES INCORPORATING  
MULTI-BARRIER PHOTONIC HETEROSTRUCTURES

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is related to U.S. Patent Application Serial No. 10/658,105 (Docket - BAT 0063 PA), filed September 9, 2003.

BACKGROUND OF THE INVENTION

10 The present invention relates generally to the propagation, direction, conditioning and other control of optical signals in optical devices and, more particularly, to the use of photonic bandgap structures in optical devices capable of operating as a wavelength separation device. Modern telecommunications networks, for example, utilize a variety of optical components to affect control of optical signals and the present invention presents a scheme for enhancing the performance of such networks by utilizing photonic bandgap structures in the networks. It is  
15 noted that reference herein to "bandgap" structures or devices incorporates not only bandgap structures where transmission of a selected wavelength of radiation is inhibited in all directions, but also structures or devices that are spatially selective with reference to the propagation of a particular wavelength of radiation, i.e., structures where transmission of a selected wavelength of radiation is inhibited in one direction, or less than all directions.

20 For the purposes of defining and describing the present invention, it is noted that the use of the term "optical" throughout the present description and claims is not intended to define a limit to any particular wavelength or portion of the electromagnetic spectrum. Rather, the term "optical" is defined herein to cover any wavelength of electromagnetic radiation capable of propagating in a waveguide. For example, optical signals in the visible and infrared portions of  
25 the electromagnetic spectrum are both capable of propagating in an optical waveguide. A waveguide may comprise any suitable signal propagating structure. Examples of waveguides include, but are not limited to, optical fibers, slab waveguides, ridge waveguides, and thin-films used, for example, in integrated optical circuits. Complex optical devices such as optical networks, isolators, circulators, multiplexers, demultiplexers, wavelength lockers, modulators,  
30 variable attenuators, dispersion compensators, power monitors, lasers, amplifiers, detectors,